

WHAT IS CLAIMED IS:

1. A process for the preparation of (co)oligomers or (co)polymers comprising preparing a mixture that includes at least one monoethylenically unsaturated monomer of the general formula (M),

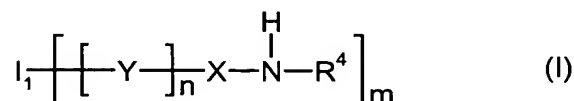


wherein

each of R^1 , R^2 , R^3 is independently selected from the group consisting of hydrogen, C_1 - C_{20} -alkyl, C_1 - C_{20} -cycloalkyl, C_6 - C_{24} -aryl, halogen, cyano, C_1 - C_{20} -alkylester, C_1 - C_{20} -cycloalkylester, C_1 - C_{20} -alkylamide, C_1 - C_{20} -cycloalkylamide, C_6 - C_{24} -arylester or C_6 - C_{24} -arylamide,

at least one oxidizing agent (A) and

at least one polymer or oligomer of the general formula (I),



wherein

Y organic residue based on ethylenically unsaturated monomers (M)

corresponding to the general formula $\text{HR}^1\text{C}=\text{CR}^2\text{R}^3$ and

R^1 , R^2 , R^3 have the aforesaid meaning,

m is an integer of 1 to 50,

n is an integer of 1 to 300 and

I₁ represents an initiator and

5 R⁴ represents a secondary or tertiary carbon atom and is independently selected from the group consisting of C₁-C₁₈-alkyl, C₂-C₁₈-alkenyl, C₂-C₁₈-alkynyl, C₃-C₁₂-cycloalkyl or C₃-C₁₂-heterocycloalkyl, C₆-C₂₄-aryl, which may be unsubstituted or substituted by NO₂, halogen, amino, hydroxy, cyano, carboxy, ketone, C₁-C₄-alkoxy, 10 C₁-C₄-alkylthio or C₁-C₄-alkylamino,

X represents a secondary or tertiary carbon atom and is independently selected from the group consisting of C₁-C₁₈-alkyl, C₂-C₁₈-alkenyl, C₂-C₁₈-alkynyl, C₃-C₁₂-cycloalkyl or C₃-C₁₂-heterocycloalkyl, 15 C₆-C₂₄-aryl, which may be unsubstituted or substituted by NO₂, halogen, amino, hydroxy, cyano, carboxy, ketone, C₁-C₄-alkoxy, C₁-C₄-alkylthio or C₁-C₄-alkylamino,

and an optional free radical initiator (B) and

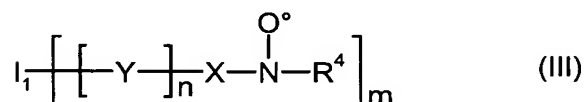
20 (II) heating the mixture at a temperature in the range of 0°C to 220°C.

2. The process according to Claim 1, wherein the mixture further contains a solvent selected from the group consisting of water, alcohols, esters, ethers, ketones, amides, sulfoxides and hydrocarbons .

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3. The process according to Claim 1, wherein the monomer (M) is selected from the group consisting of styrene, substituted styrene, conjugated dienes, acrolein, vinyl acetate, acrylonitrile, methyl acrylate, methyl methacrylate, butyl acrylate, butyl methacrylate, 2-ethylhexyl acrylate, 30 cyclohexyl methacrylate, isobornyl methacrylate and maleic anhydride.

4. The process according to Claim 1, wherein the oxidizing agent (A) is selected from the group consisting of peracetic acid, perpropionic acid, hydrogen peroxide, hydrogen peroxide/titanium containing catalysts, potassium peroxymonosulfate ($2 \text{KHSO}_5 \cdot \text{KHSO}_4 \cdot \text{K}_2\text{SO}_4$), silver oxide and lead (IV) oxide.
5. The process according to Claim 1, wherein the temperature in (II) is 50 to 180°C.
6. The process according to Claim 1, wherein the temperature in (II) is 70 to 150°C.
7. The process according to Claim 1, wherein the mixture is prepared at a temperature of 0 to 100°C.
8. The process according to Claim 1, wherein the mixture is prepared temperature of 0 to 50°C.
9. A process for the preparation of nitroxyl radicals of the general formula (III),



wherein

- Y organic residue based on ethylenically unsaturated monomers (M) corresponding to the general formula $\text{HR}^1\text{C}=\text{CR}^2\text{R}^3$ and $\text{R}^1, \text{R}^2, \text{R}^3$ is independently selected from the group consisting of: hydrogen, C_1 - C_{20} -alkyl, C_1 - C_{20} -cycloalkyl C_6 - C_{24} -aryl, halogen, cyano, C_1 - C_{20} alkyl ester C_1 - C_{20} -cycloalkyl ester, C_1 - C_{20} -

alkylamide, C₁-C₂₀-cycloalkylamide C₆-C₂₄-aryl ester or C₆-C₂₄-
arylamide,

m is an integer of 1 to 50,

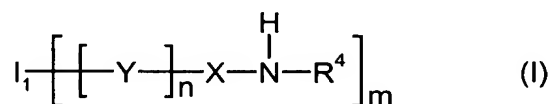
n is an integer of 1 to 300, and

I₁ represents an initiator and

R⁴ represents a secondary or tertiary carbon atom and is independently
selected from the group consisting of C₁-C₁₈-alkyl, C₂-C₁₈-alkenyl,
C₂-C₁₈-alkynyl, C₃-C₁₂-cycloalkyl or C₃-C₁₂-heterocycloalkyl,
C₆-C₂₄-aryl, which may be unsubstituted or substituted by NO₂,
halogen, amino, hydroxy, cyano, carboxy, ketone, C₁-C₄-alkoxy,
C₁-C₄-alkylthio or C₁-C₄-alkylamino,

X represents a secondary or tertiary carbon atom selected from the
group consisting of C₁-C₁₈-alkyl, C₂-C₁₈-alkenyl, C₂-C₁₈-alkynyl,
C₃-C₁₂-cycloalkyl or C₃-C₁₂-heterocycloalkyl, C₆-C₂₄-aryl, which
may be unsubstituted or substituted by NO₂, halogen, amino,
hydroxy, cyano, carboxy, ketone, C₁-C₄-alkoxy, C₁-C₄-alkylthio or
C₁-C₄-alkylamino,

comprising forming a mixture that contains a polymer or an oligomer
conforming to formula (I)



wherein

I₁, Y, n, X, R⁴ and n are as defined above, and an oxidizing agent, and
isolating the compound of formula (III).